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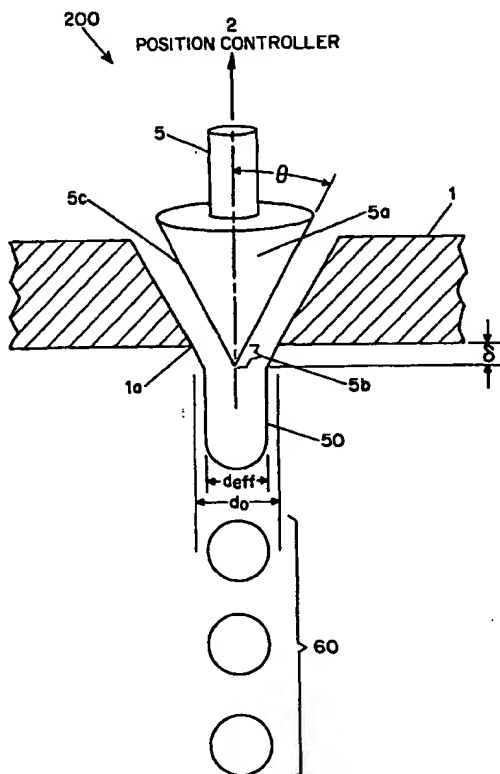
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(54) Title: CRUCIBLE AND SPINDLE FOR A VARIABLE SIZE DROP DEPOSITION SYSTEM



(57) Abstract: An apparatus for forming three-dimensional objects includes a crucible (1) for holding a molten material; a conically-shaped orifice (1a) having a fixed outlet diameter ( $d_o$ ) at the bottom of the crucible through which a jet (50) of the molten material flows towards the substrate; and an oscillating mechanical member (5) for breaking the flow of molten material into the molten material drops (60). The oscillating mechanical member further includes a conically-shaped head (5a) for cooperating with the orifice (1a) and for varying the effective size of the orifice. The conically-shaped head includes a slanted radial portion (5c) and a tip portion (5b) extending through the orifice. The effective diameter ( $d_{eff}$ ) of the jet is defined by the relationship  $d_{eff} = [d_o^2 - (d_o \cdot \delta \tan \theta)^2]^{1/2}$ , wherein  $\delta$  represents the amount of the tip portion extending through the orifice, and  $\theta$  represents a slant angle corresponding to the slanted radial portion of the conically-shaped head.

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